

Course Syllabus

1	Course title	Human Genetics
2	Course number	0334282
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3+0
4	Prerequisites/corequisites	Genetics 0304281
5	Program title	B.Sc. in Biological Sciences
6	Program code	0304
7	Awarding institution	University of Jordan
8	School	Faculty of Sciences
9	Department	Biological Sciences
10	Level of course	Senior (3ed year)
11	Year of study and semester (s)	First and Second semesters 2020-2021
12	Final Qualification	B.Sc. in Biological Sciences
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	Feb. 28, 2022

16. Course Coordinator:

Name: Dr. Tareq Alhindi
 Office number: 302
 Phone number: 22236
 Email: t.alhindi@ju.edu.jo

17. Other instructors:

18. Course Description:

This course will introduce students to human genetics; DNA structure, techniques of gene analysis, chromosome structure and cell division, immunogenetics, Cancer, genes in kindreds, somatic cell hybridization, cytogenetics, multifactorial inheritance, the human gene map, heritability, population statistics, genetic testing in individuals and populations, human biochemical disorders, gene therapy and genetic counselling.

19. Course aims and outcomes:

A- Aims:

- The laws of heredity in humans and to apply them on the study of inherited traits.
- The basics of; sex determination, the composition and function of genes, the causes and effects of mutation, population genetics, the genetics of immunity and cancer, the contribution of heredity to behaviour and intelligence, basic principles of epigenetics, genetic counselling, and genetic technologies.

B- Intended Learning Outcomes (ILOs):

Upon successful completion of this course, students will be able to:

- 1- Introduction to the structural organization of the human genome, the mechanisms contributing to the genome variability, the main types of genetic variation (SNPs, CNVs, aneuploidy, etc.).
- 2- Understand the basic concepts of DNA structure, replication and gene expression.
- 3- Understand the basic concepts of RNA structure, types and functions in human.
- 4- Understand the basic concepts and applications of Mendelian genetics in humans.
- 5- Understand the basic concepts and applications of Non-Mendelian genetics in humans.
- 6- Understand the basic concepts of extranuclear Inheritance in humans.
- 7- Know how to draw a family pedigree with comprehensive information.
- 8- Understand the basic concepts of karyotyping and chromosomal aberrations.
- 9- Recognize the main types of chromosomal aberrations.
- 10- Understand the principles, mechanisms and classification of congenital anomalies.
- 11- Understand the principles of chromosomal disorders.
- 12- Differentiate between the main patterns of single-gene inheritance.
- 13- Multifactorial and Behavioural Traits.
- 14- Understand the basic principles of epigenetics and genetic imprinting.
- 15- Understand the basic principles of the genetics of immunity, cancer genetics and genomics.

20. Topic Outline and Schedule:

Week	Topic	Schedule		Assignments (Done by every Sunday BEFORE class)
		Day	Resources	
1	Introduction	Mon	Literature – Course Book	
	Genes and Genomes	Wed	Literature	
2	DNA Structure and Function	Mon	Discussion and review	DNA conformations
	Repetitive DNA in the Human genome	Wed	Literature	
3	RNA Structure and Function	Mon	Literature	
		Wed	Discussion and review	WGS & You

4	Human Cells and the Individual	Mon	Literature – Course Book	
		Wed	Discussion and review	Neanderthal DNA
5	Human Reproduction Birth defects	Mon	Literature – Course Book	
		Wed	Discussion and review	Genetics Of Aging
6	The Laws of Heredity Pedigree analysis	Mon	Literature – Course Book	
		Wed	Discussion and review	
7	Beyond Mendel’s Laws Mitochondrial genes	Mon	Literature – Course Book	
		Wed	Discussion and review	
8	Sex-linked and Sex-limited Genes	Mon	Literature – Course Book	
		Wed	Discussion and review	X inactivation
9	Multifactorial Traits	Mon		
		Wed		
10	Genetics of behaviour	Mon	Literature – Course Book	
		Wed	Discussion and review	Genetic determinism
11	Gene Expression and Epigenetics	Mon	Literature – Course Book	
		Wed	Discussion and review	
12	Mutation and Repair	Mon	Literature – Course Book	
		Wed	Discussion and review	
13	Chromosomes and Chromosomal Aberrations	Mon	Literature – Course Book	
		Wed	Discussion and review	
14	Population Genetics	Mon	Literature - Online	
		Wed	Discussion and review	Hardy-Weinberg Equilibrium
15	Genetics of Cancer	Mon	Literature – Online	
		Wed	Discussion and review	Oncogenetics
16	Final Exam			

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Blended Learning + Flipped Learning
- Synchronous lecturing/meeting; Asynchronous lecturing/meeting

22. Evaluation Methods and Course Requirements:

Evaluation Activity	Mark	Topic(s)	Period (Week)	Platform
Midterm Exam	30		TBA	Written
Assignments, Homework and Reports	30		TBA	Moodle / E-mail
Final Exam	40		TBA	Written

23. Course Policies:

A- Attendance policies:

Enrolled students are expected to attend the lectures in line with the university of Jordan policy as outlined in the JU student handbook. Failure to do so will make the student subject to the penalties outlined in the said document. Furthermore, missing classes will have negative repercussions on the student's participation grade.

B- Absences from exams and submitting assignments on time:

You should talk to your instructor as soon as possible if you miss an exam. All such cases will be dealt with according to the UJ student handbook rules.

C- Health and safety procedures:

To be announced during laboratory introduction as explained in the laboratory manual.

D- Honesty policy regarding cheating, plagiarism, misbehaviour:

All violations pertaining to cheating, plagiarism and misbehaviour will be dealt with in accordance to the rules outlined in the UJ student handbook. In order to avoid plagiarism, the sources for the information contained in your homework must be properly cited and verbatim quotations must be limited and explicitly presented as such. To learn more about the procedures for ethical referencing of information and how to assess the credibility of information critically you can consult with the relevant documents in the course UJ e-learning page (see below).

E- Available university services that support achievement in the course:

Moodle course page at University of Jordan e-learning portal: <https://elearning.ju.edu.jo/>

24. Required equipment: (Facilities, Tools, Labs, Training....)

A PC or new smartphone with MS Teams installed and an adequate internet connection; a suitable internet browser to open the Moodle webpage E-learning and JU Exams, and to access Facebook to follow course group.

25. References:

1. Lewis, Ricki. (2015). Human genetics: Concepts and applications (11th ed). ISBN 978-0-07-352536-5.
2. Tobias, Edward. et.al. (2011). Essential Medical Genetics (6th ed). ISBN: 9781405169745.

B- Recommended books, materials and media:

Articles, Videos and other material will be provided to students through the online portal (E-Learning) and the course group on Facebook.

26. Additional information:

Course Assessment:

- **Online Assessment (30)**
- **In-Class Assessment (70)**

Name of Course Coordinator: Dr. Tareq Alhindi Signature: ----- Date: -----

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----